Table 2-3: Summary of Impacts and Mitigation Measures for the Proposed Action and No Action Alternative

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Land Use and Recreation		
▪ Temporary disturbance to upland bird hunting in project vicinity ▪ Approximately ~~47~~ 63 acres impacted by new roads, ~~93~~ 186 acres impacted by tower construction, and 25 acres of poplar trees cut and converted to agriculture compatible with the transmission line	▪ Locate towers and roads so as not to disrupt irrigation circles, where possible ▪ Locate structures and roads outside of agricultural fields, orchards, and vineyards, where possible ▪ Coordinate with landowners for farm operations, including plowing, crop dusting, and harvesting ▪ Redesign irrigation equipment and compensate landowner for additional reasonable costs where new right-of-way needs to be acquired ▪ Compensate farmers for crop damage and restore compacted soils ▪ Control weeds around the base of the towers ▪ Keep gates and fences closed and in good repair to contain livestock ▪ Repair damages to access roads caused by or arising out of Bonneville use, leaving roads in good or better condition than prior to construction.	▪ No impact
Geology, Soils, and Seismicity		
▪ Removal of vegetation and disturbance to underlying soils in an area of up to ~~222~~ 183 acres ▪ Operation and maintenance activities could increase erosion potential along the project corridor ▪ Temporary removal of vegetation and disturbance to underlying soils in an area up to 226 acres	▪ Minimize vegetation removal ▪ Avoid construction on steep slopes where possible ▪ Properly engineer cut-and-fill slopes ▪ Install appropriate roadway drainage to control and disperse runoff ▪ ~~Ensure graveled surfaces on access roads in areas of sustained wind~~ In areas of potential wind erosion, apply gravel to access road surfaces. ▪ ~~Develop additional mitigation measures (using a certified engineer) between corridor miles 39 and 41 due to the presence of an active landslide in the vicinity of tower 40/3~~ ▪ In area of landslide (corridor miles 39 and 41) do not construct any new roads within 100 feet of slide area; reshape existing access road with out-slope to provide drainage; and site tower east of area, if possible.	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Geology, Soils, and Seismicity, continued		
	▪ Apply erosion control measures such as silt fence, straw mulch, straw wattles, straw bale check dams, other soil stabilizers, and reseeding disturbed areas as required (prepare a Stormwater Pollution Prevention Plan). ▪ Regularly inspect and maintain project facilities, including the access roads, to ensure erosion levels remain the same or less than current conditions ▪ Consider helicopter construction in areas of steep slopes to lessen the size of access roads and temporary tower site impacts (laydown areas of materials).	
Streams, Rivers, and Fish		
▪ Potential transport of sediment to fish-bearing waters ▪ Potential accidental spills of construction materials into waterways ▪ Potential dry wash crossing and culvert installation ▪ Potential blasting near fish-bearing waters ▪ Implementation of vegetation management techniques	▪ Place towers outside of stream riparian areas and utilize natural landscape features to span the conductor over existing shrub and tree riparian zones and avoid cutting. ▪ Place new access roads outside of stream riparian areas, where possible. ▪ Construct fords instead of culverts at access road crossings of dry washes or seasonal streams if possible. If culverts are required, design and install to accommodate flows associated with a 100-year flood event. ▪ Where access roads cross a dry wash, the road gradient should be 0% to avoid diverting surface waters from the channel. ▪ Preserve existing vegetation where practical, especially next to intermittent and perennial streams. ▪ Avoid construction within the 200-foot designated stream buffers in Klickitat and Benton Counties, Washington. ▪ Maximize the use of existing roads, minimizing the need for new road construction. ▪ Avoid tower or access road construction on potentially unstable slopes where feasible. ▪ Install appropriate water and sediment control devices at all dry wash crossings, if necessary.	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Streams, Rivers, and Fish, continued		
	▪ Use erosion control methods during construction (see mitigation measures for Geology, Soils, and Seismicity, Chapter 3), to minimize transport of sediments to streams via runoff. ▪ Reseed disturbed areas following construction where appropriate. ▪ Construct any required culverts using Washington Department of Fish and Wildlife culvert installation guidelines. Methods may include avoiding installation during periods of flow, armoring streambanks near the culvert entrance and exit, installing culverts on straight sections of stream to ensure unimpeded flow, and following the contour of the stream channel. ▪ Repair existing road failures and drainage devices between corridor mile 33 to 47 to reduce potential impacts to dry washes. ▪ ~~Avoid blasting during periods when salmonid eggs or alevins are present in gravels.~~ ▪ ~~Avoid blasting within 200 feet of fish bearing or potentially fish bearing streams.~~ ▪ Avoid blasting within 200 feet of fish-bearing or potentially fish-bearing streams during periods when salmonid eggs or alevins are present in gravels. ▪ Conduct in-water work at the Columbia River during Corps of Engineers designed in-water work windows. ▪ Develop and implement a Spill Prevention and Contingency Plan to minimize the potential for spills of hazardous material including provisions for storage of hazardous materials and refueling of construction equipment outside of riparian zones, spill containment and recovery plan, and notification and activation protocols. ▪ Keep vehicles and equipment in good working order to prevent oil and fuel leaks. ▪ Return staging areas to pre-construction condition.	

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Streams, Rivers, and Fish, continued		
	▪ Site staging areas away from stream beds. For Columbia River water work: ▪ Site staging 150 feet or more from water body. ▪ If working within 150 feet of water body, check vehicles daily for leaks and diaper stationary power equipment. ▪ Construct during recommended Corps in-water work windows for the Columbia River (December 1 thru March 31). ▪ Isolate in-water work area and capture and release fish from the work area under the supervision of a competent fisheries biologist experienced to capture ESA-list fish. ▪ Use appropriate fish screens on all intakes and pumps.	
Vegetation		
▪ Proposed project would temporarily disturb ~~121~~ 211 to ~~134~~ 226 acres depending on the number and location of conductor tensioning sites ▪ Temporary impact to ~~24~~ 42 to ~~27~~ 44 acres of native plants and ~~4~~ 7 acres of cryptogramic crusts; permanent impact to ~~12~~ 19 acres of native plants and ~~2~~ 3 acres of cryptogramic crusts ▪ Establishment of noxious weeds ▪ Vegetation loss due to fire	▪ Locate the proposed transmission line adjacent to the existing corridor to minimize additional clearing. ▪ Utilize the existing access road system to the extent possible to reduce the need for new access roads. ▪ Keep vegetation clearing to the minimum required to maintain safety and operational standards. ▪ Avoid construction activities or permanent tower or access road siting in native shrub-dominated shrub-steppe communities, if possible. ▪ Reseed areas temporarily disturbed in higher quality shrub-steppe with native grasses and forbs (if recommended by local county) and salvage topsoil and bunchgrass plant material. Reseeding should occur at the appropriate planting season. Reseed all disturbed areas with seeds recommended by the local county. ▪ Equip all vehicles with basic fire-fighting equipment including extinguishers, shovels, and other equipment deemed appropriate for fighting grass fires. ▪ Avoid tree removal to the extent possible.	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Vegetation, continued		
	▪ Limit construction equipment to tower sites, access roads, and conductor tensioning sites. ▪ If Utes ladies' tresses is found during August 2002 surveys, avoid construction or construction activities in that location. ▪ Avoid construction or construction activities at location of desert evening-primrose (*Oenothera caespitosa ssp. marginata*) near tower 47/1. ▪ Minimize disturbance to native shrub-dominated shrub-steppe communities ~~species~~ and cryptogamic crusts ~~to the extent~~ where possible during construction~~ to prevent invasion by nonnative species.~~ Where not possible, consider compensatory habitat through either restoration or acquisition and preservation of shrub-steppe communities. ▪ Conduct a pre-construction and a post-construction noxious weed survey to determine if construction contributed to the spread of noxious weed populations. ▪ Enter into active noxious weed control programs with land owners/mangers or county weed control districts where activities may have caused or aggravated an infestation. ▪ Wash vehicles that have been in weed-infested areas (removing as much weed seed as possible) before entering areas of no known infestations. ▪ Use certified weed-free mulching.	
Wildlife		
▪ Construction noise and activities would cause some wildlife to avoid areas of active construction ▪ Temporary impact to ~~24~~ 89 to ~~27~~ 95 acres of shrub-steppe habitat and permanent impact to ~~12~~ 42 acres of shrub-steppe	▪ Prior to construction, conduct raptor nest surveys (for existing and new nests) of cliffs located within 0.25 mile of the right-of-way (corridor miles 3, 54, 56, 57, 72, 73). See potential mitigation measures below for specific species. ▪ Between January 1 and July 30, avoid using helicopters within 0.25 mile of cliffs identified as Priority Habitat by the Washington Department of Fish and Wildlife (use ground-based equipment near cliffs. ▪ If bald eagle nests are found on the cliffs, restrict construction during nesting season (January 1 through July 15).	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Wildlife, continued		
▪ Potential for bird collisions with new transmission line, particularly where line would cross open water or wetlands	▪ Avoid blasting cliffs identified as Priority Habitat by Washington Department of Fish and Wildlife and consult with the Washington Department of Fish and Wildlife or Oregon Department of Wildlife regarding measures to minimize nest disturbance on a site-by-site basis if nests are found. ▪ **Mitigation for burrowing owls.** If possible, avoid disturbance within 160 feet of occupied burrows during the non-breeding season of September 1 through January 31 or within 250 feet during the breeding season of February 1 through August 31. ▪ **Mitigation for peregrine falcon.** If possible, avoid disturbance within 0.25 mile of any active nests during the breeding season (March through June). ▪ **Mitigation for prairie falcon.** If possible, avoid construction activities between February 15 and July 15 within 0.25 mile of active nests. ▪ **Mitigation for red-tail hawk.** If possible, avoid construction activities within 320 feet between February 15 and July 15. ▪ **Mitigation for other raptors.** Consult with Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife. ▪ ~~If deemed appropriate, i~~Install line markers in avian flight paths or migration corridors, ~~such as~~ near crop circles in the vicinity of the town of Paterson (north of the Umatilla National Wildlife Refuge) ~~if appropriate~~ and at the Columbia River crossings and the Rock Creek crossing. ▪ For the McNary Substation Alternatives, avoid placing towers and lines across wetlands to minimize risk of bird collision. ▪ Minimize the amount of shrub-steppe plant communities removed by clearing only the amount of vegetation necessary to prepare tower footings or build roads. ▪ Minimize road construction in shrub-steppe areas with burrows. Burrows were found in the field near corridor miles 19, 21, 63, and 76. ▪ Span riparian corridors to minimize removal of shrubs or trees within riparian areas.	

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Wetlands and Groundwater		
▪ Accidental spills of hazardous or toxic materials used or stored on the project site (fuels, lubricants, solvents) ▪ Potential removal of wetland buffer vegetation and less than 1.0 acre of wetland fill at corridor miles 2, 13, 34, 36, between 42 and 47, 48, 49, 50, 66, ~~and between corridor mile~~ 71 and ~~74~~72, with risk of increasing silt and sediment to wetlands	▪ Locate structures, new roads, and staging areas so as to avoid waters of the U.S., including wetlands. Where avoidance is not possible, provide compensation for wetland impacts in accordance with Corps Section 404 permitting requirements. ▪ Avoid construction within designated Klickitat and Benton Counties, Washington wetland and stream buffers to protect potential groundwater recharge areas (Klickitat County Critical Areas Ordinance; Benton County Code Title 15). ▪ Avoid mechanized land clearing within wetlands and riparian areas to avoid soil compaction from heavy machinery, destruction of live plants, and potential alteration of surface water patterns to reduce groundwater turbidity risk. ▪ Anticipate and avoid, as required, contaminated soil and underground tanks during construction activities near pipelines and agricultural and other historic projects. Anticipate and avoid orphaned wells, as required, particularly near the communities of Plymouth, Paterson, Roosevelt, Sundale, and Towal. ▪ Use erosion control measures (see mitigations listed in the Soils, Geology, and Seismicity section) when conducting any earth disturbance within 100 feet of wetlands, or within the resource buffer as established by Benton and Klickitat Counties. ▪ Avoiding refueling and/or mixing hazardous materials where accidental spills could enter surface or groundwater. ▪ Using existing road systems, where possible, to access tower locations and for the clearing of the transmission line alignment. ▪ Avoid construction on steep, unstable slopes if possible. ▪ Place tower footings on upland basalt outcroppings and limit access road construction in wetlands complex and buffers between corridor miles 70 and 74, if possible. ▪ Place tower footings and access roads within uplands within the wetland complex between corridor miles 48 and 50.	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Wetlands and Groundwater, continued		
	▪ Avoid placing towers and roads that would necessitate the cutting of the palustrine-forested wetland near the McNary Substation (Alternative B).	
Cultural Resources		
▪ Disturbance of undiscovered hunter-fisher-gatherer resources or unrecorded cultural resources	▪ Locate structures, new roads, and staging areas so as to avoid known cultural resource sites. ▪ Utilize existing access road system to the extent possible to reduce the need for new access roads. ▪ Limit construction equipment to tower sites, access roads and conductor tensioning sites. ▪ ~~Limit the number of contractors to cultural resource site sensitive information on a need-to-know basis.~~ ▪ On maps and in specifications provided to construction contractors, indicate cultural sites as generic avoidance areas to maintain site confidentiality. ▪ ~~Continue consultation with the Umatilla Tribes and the Yakama Nation to determine appropriate tribal monitoring for ground disturbing activities.~~ ▪ Have a monitor on site for construction activities in and around sites eligible for listing in the National Register of Historic Places. ▪ Determine sites to be monitored based on Bonneville practices for avoiding adverse effects to historic properties, tribal concerns and the Oregon and Washington SHPO concurrence. ▪ Continue consultation with the Umatilla Tribes, Warm Spring Tribes, and the Yakama Nation to set up consultation protocols on site mitigation and management. ▪ Continue consultation with the Umatilla Tribes, the Warm Springs Tribes, and the Yakama Nation to ensure that the cultural and natural resources are protected.	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Cultural Resources, continued		
	▪ Conduct offsets and buffers around previously recorded and newly identified archaeological sites based on BPA practices for avoiding adverse effects to historic properties, tribal concerns and the Oregon and Washington SHPO concurrence. ▪ If previously unknown artifacts are identified during construction, contact representatives of the affected tribes. ▪ Stop all construction activities in the immediate area should any previously unknown artifacts be identified during construction until the resource can be evaluated by an archaeologist meeting the Secretary of the Interior's Qualifications Standards for Archaeology (48 FR 44738-39). Prehistoric site indicators include, but are not limited to, chipped stone, obsidian tools and tool manufacture debitage (waste flakes), grinding implements such as mortars and pestles, and darkened soil that contains organic remains of food production such as animal bone and shellfish remains. Historic site indicators include, but are not limited to, ceramic, glass, wood, bone, and metal remains. ▪ For previously unknown artifacts, identify type and significance of discovered resource for determining if avoidance is necessary, depending on the type and significance of any discovered resource, procedures may include testing the site with shovel test probes to determine site boundaries and any possible subsurface components. If results of the shovel test probes determine the presence of an extensive subsurface component, move structure location to a suitable location that avoids the site. Alternatively, develop and implement a full data recovery program for the site in consultation with the affected tribes and the Oregon and Washington State historic preservation officers. ▪ Stop construction in the area immediately should human remains and/or burials be encountered. Secure the area, placing it off limits for anyone but authorized personnel.	

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Visual Resources		
▪ Temporary alterations to viewscape from construction activities ▪ Change in viewscape; impacts would be greatest for residential viewers	▪ Site all construction staging and storage areas away from locations that would be clearly visible from SR 14 as much as practical. ▪ Provide a clean-looking facility following construction by cleaning-up after construction activities. ▪ Keep the areas around the towers clean and free of debris. ▪ Provide regular maintenance of the access roads and fences within and leading to the corridor.	▪ No impact
Socioeconomics, Public Services, and Utilities		
▪ Potential benefit to local and regional economies through employment opportunities and purchase of goods and services ▪ Increased demand on local emergency response resources such as fire, police, and medical personnel and facilities ▪ Minor reduction on local taxing from any reduction in property values	▪ None required	▪ No impact
Transportation		
▪ Short interruptions of SR 14 traffic from construction activities ▪ Possible damage to farm roads during construction ▪ Potential for increased unauthorized access following project construction	▪ Coordinate routing and scheduling of construction traffic with state and county road staff and Burlington Northern Santa Fe Railway. ▪ Employ traffic control flaggers and post signs warning of construction activity and merging traffic, when necessary for short interruptions of traffic. ▪ Repair any damage to local farm roads caused by the project. ▪ Install gates on access roads when requested by property owners to reduce unauthorized use.	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Air Quality		
▪ Combustion pollutants from equipment exhaust and fugitive dust particles from disturbed soils becoming airborne	▪ Water exposed soil surfaces if necessary to control blowing dust. ▪ Cover construction materials if they are a source of blowing dust. ▪ Limit vehicle speeds along dirt roads to 25 miles per hour. ▪ Shut down idling construction equipment, if feasible.	▪ No impact
Noise		
▪ Residents in the vicinity of the project site could experience construction noise (associated with grading and earthmoving activities, hauling of materials, and building of towers) above Washington and Oregon noise standards ▪ Potential radio and television interference	▪ All equipment to have sound-control devices no less effective than those provided on the original equipment. ▪ No equipment to have an unmuffled exhaust. ▪ Construction activities would be limited to daytime hours. ▪ No noise-generating construction activity to be conducted within 1,000 feet of a residential structure between the hours of 10:00 p.m. and 7:00 a.m. ▪ Landowners directly impacted along the corridor will be notified prior to construction activities. ▪ Bonneville will take measures to restore reception to a quality of reception as good or better than before the radio or television interference.	▪ No impact
Public Health and Safety		
▪ Health and safety risks for workers, farmers, aviators, and visitors	▪ Prior to starting construction, contractor would prepare and maintain a safety plan in compliance with Washington and Oregon requirements. This plan would be kept on-site and would detail how to manage hazardous materials such as fuel, and how to respond to emergency situations. ▪ During construction, the contractors would also hold crew safety meetings at the start of each workday to go over potential safety issues and concerns. ▪ At the end of each workday, the contractor and subcontractors will secure the site to protect equipment and the general public. ▪ Employees would be trained, as necessary, in tower climbing, cardiopulmonary resuscitation, first aid, rescue techniques, and safety equipment inspection.	▪ No impact

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Public Health and Safety, continued		
	▪ To minimize the risk of fire, fuel all highway-authorized vehicles off-site. Fueling of construction equipment that was transported to the site via truck and is not highway authorized would be done in accordance with regulated construction practices and state and local laws. Helicopters would be fueled and housed at local airfields or at staging areas. ▪ Helicopter pilots and contractor take into account public safety during flights. For example, flight paths could be established for transport of project components in order to avoid flying over populated areas or near schools (Helicopter Association 1993). Contractors would also work with local crop dusters and agricultural businesses to minimize interruption in agricultural activity during construction (for instance, to schedule work or tower placement so it does not conflict with crop dusting and harvesting). ▪ Provide notice to public of construction activities, including blasting. ▪ Take appropriate safety measures for blasting consistent with state and local codes and regulations. Remove all explosives from the work site at the end of the workday. ▪ If implosion bolts are used to connect the conductors, install in such a way as to minimize potential health and safety risks. ▪ Inform construction and operation/maintenance workers that there is a Umatilla Army Depot emergency preparedness program in the event of a chemical release. ▪ Operation and maintenance vehicles would carry fire suppression equipment including (but not limited to) shovels and fire extinguishers. ▪ Stay on established access roads during routine operation and maintenance activities. Smoking would be prohibited. ▪ Keep vegetation cleared according to Bonneville standards to avoid contact with transmission lines. ▪ Submit final tower locations and heights to the Federal Aviation Administration for review and potential marking and lighting requirements.	

Table 2-3, continued

Proposed Action		No Action
Potential Impacts	**Mitigation Measures**	**Potential Impacts**
Public Health and Safety, continued		
	▪ Construct and operate the new transmission line to meet the National Electrical Safety Code. ▪ During construction, follow Bonneville specifications for grounding fences and other objects on and near the proposed right-of-way. ▪ Should contaminated media be unexpectedly encountered during construction, work should stop and an environmental specialist called to characterize the nature and extent of contamination and determine appropriate State-approved measures to prevent spread and protect health and safety. ▪ As necessary, employees would be trained in tower climbing, cardiopulmonary resuscitation, first aid, rescue techniques, and safety equipment inspection. ▪ If blasting is required, a notice would be sent to residents in the affected area. A public meeting would be held prior to blasting to inform residents and other interested parties of the date and time of the blasting and to answer questions. During blasting, appropriate safety measures would be taken as required by state and local codes and regulations. All explosives would be removed from the work site at the end of the work day. ▪ The corridor would be maintained to control tall grass that could potentially start fires via contact with hot vehicle parts. Trees and other tall vegetation would be trimmed to Bonneville standards to avoid contact with transmission lines. ▪ The towers are not expected to exceed 200 feet in height. However, Federal Aviation Administration laws would be followed regarding the placement of line markers to warn approaching aircraft. Bonneville would submit final locations and tower heights to the Federal Aviation Administration for review and requirements for markings and lighting would be addressed at that time. ▪ ~~Because of the proximately of the proposed transmission line to agricultural fields, crop dusting pilots planning to enter the area would take suitable precautions to avoid collision with the proposed transmission lines.~~	